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Committee on the Peaceful Uses of Outer Space

Report on the Second United Nations/International Academy of Astronautics Workshop on Small Satellites at the Service of Developing Countries: the African Perspective

(Toulouse, France, 2 October 2001)

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I. Introduction

A. Background and objectives

1. The Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III) recommended inter alia that the joint development, construction and operation of a variety of small satellites offering opportunities to develop indigenous space industry should be undertaken as a suitable project for enabling space research, technology demonstrations and related applications in communications and Earth observation.[1] Additional recommendations emanated from the activities of the Technical Forum held at UNISPACE III.[2] In accordance with those recommendations, the Office for Outer Space Affairs of the Secretariat has substantially extended its existing cooperation with the Subcommittee on Small Satellites for Developing Nations of the International Academy of Astronautics (IAA).[3]

2. At its forty-third session, in 2000, the Committee on the Peaceful Uses of Outer Space endorsed the programme of workshops, training courses, symposia and conferences planned for 2001.[4] Subsequently, the General Assembly, in its resolution 55/122 of 8 December 2000, endorsed the United Nations Programme on Space Applications for 2001.

3. At the 1999 meeting of the IAA Subcommittee, it was agreed that the fifty-first International Astronautical Congress, which was to be held in Rio de Janeiro from 2 to 6 October 2000, would be an ideal opportunity to review the status and advancement of programmes in Latin America. It was further agreed that the workshop should be open to participants from other regions, but that the situation in Latin America would be used as an example of how developing countries could benefit from small satellites and that it should form the core of the discussion. The report of the first United Nations/IAA Workshop (A/AC.105/745) was submitted to the Scientific and Technical Subcommittee at its forty-fourth session in 2001. Based on the positive response from participants and from States members of the Committee, it was decided that the second workshop, to be held in 2001, should encourage the development of small satellite technology in Africa.

4. The United Nations/International Academy of Astronautics Workshop on Small Satellites at the Service of Developing Countries: the African Perspective was held in Toulouse, France, on 2 October 2001. It was the second workshop organized jointly by the Office for Outer Space Affairs and Subcommittee on Small Satellites for Developing Nations of the International Academy of Astronautics within the framework of the International Astronautical Congress.

B. Attendance

5. The Workshop was an integral part of the International Astronautical Congress and was attended by as many as 40 registered Congress participants. Many of those attending the Workshop had also attended the United Nations/International Astronautical Federation Workshop on Making Space Applications Operational: Opportunities and Challenges for Sustainable Development, held in Albi, France, immediately before the Congress (from 27 to 29 September 2001) (A/AC.105/775). The sponsors of the workshop held in Albi (the United Nations, the European Space Agency and the Centre national d'études spatiales (CNES) of France) had provided financial support to selected participants from developing countries and the International Astronautical Federation had waived the registration fee for them.

6. One of the objectives of the Workshop was to review the advancements made in Africa in the development and utilization of small satellites in the light of the recommendations of the previous workshops organized by the IAA Subcommittee. The Workshop was also attended by several participants of previous workshops who provided valuable continuity and were able to assess progress made during the series of workshops.

II. Summary of presentations

7. Six papers were presented at the Workshop. Most of them described the current situation and advanced projects in Africa and in other regions.

8. The first paper, by the co-chairmen of the Workshop, gave an overview of the results achieved during workshops held at UNISPACE III and in Latin

America. Used as an introduction to the Workshop, the presentation stressed the applicability of the results and conclusions of previous workshops to the African countries.

9. The second paper, by the Director of the United Nations Office for Outer Space Affairs, underlined the importance of small satellites in the use of space technology for sustainable development. Emphasis was placed on capacity-building through technology transfer and training programmes. Financing and intellectual property rights associated with technology transfer were highlighted.

10. Based on the successful SUNSAT programme, South Africa was seeking further development of its space activities in relation to the actual needs of the African countries. The South African paper emphasized that real application needs existed, particularly if access to low-cost data could be provided for better decision-making. The SUNSAT programme had demonstrated that high-resolution remote sensing with small satellites was possible for applications such as agriculture, water resource management or disaster mitigation. The paper also indicated that existing technological capabilities, especially those developed in the framework of the SUNSAT programme, could be pulled together to execute a completely new programme. Finally, such a programme would provide economic benefits not only in the areas of application indicated above, but also in education and training, and in the development of industry and spin-off enterprises.

11. Participants were informed of a worldwide Disaster Monitoring Constellation Project consisting of five small satellites that would provide for daily revisit to a particular region to monitor rapidly changing conditions during disasters. Each satellite would be contributed by a different country. Algeria was building its first satellite, Alsat-1, as part of a know-how and technology transfer programme with the United Kingdom of Great Britain and Northern Ireland. Algeria and the United Kingdom were two of the five partners, together with another African country, Nigeria, and two Asian countries, China and Thailand. In addition to its primary mission as part of the constellation, each satellite could also be used for the particular needs of the respective member country. In the case of Algeria, monitoring of agricultural land use or industrial and marine pollution, or verification of cartography for infrastructure development were applications of great interest, as well as the more specific regional application for intensive desertification monitoring.

12. Tunisia expressed its interest in space activities, possibly in cooperation with other countries from the Maghreb region. A preliminary study had been undertaken as a cooperative exercise between Tunisia and France on a small satellite mission for climatic data collection and remote monitoring of lakes and dams. Other space applications in the field of telecommunications and for access to the information society were also mentioned as important goals for Tunisia.

13. A paper from Brazil presented another possible cooperative programme between continents, namely a global monitoring equatorial system derived from Brazil's remote sensing satellite Amazon Rainforest Observation System (SSR). The innovative programme, directed towards the specific needs of low-latitude regions and based on a small remote sensing satellite placed into an equatorial orbit, could increase the revisit frequency and provide near-real-time data transmission. Applications of such a satellite would be the monitoring of deforestation, forest fires, flooding, desertification, mineral exploitation or various sea activities. The receiving station and mission centre located in Africa could serve users in the African equatorial region, and preliminary contacts for such cooperation had been initiated.

III. Conclusions and recommendations

14. The Workshop clearly demonstrated that there were tremendous spin-offs to be gained from introducing space activities through a small satellite programme.

15. The Workshop stressed the importance of placing the main focus on those applications that would provide sustainable economic benefits for developing countries in Africa.

16. In the presentations, it was emphasized that, as the African experience grew, it could yield practical results by demonstrating that small satellites could be effective in addressing regional problems. For example, the reported experiences emphasized the importance of small satellite applications for remote

sensing, especially in the fields of disaster mitigation, agriculture, desertification and forest monitoring.

17. The participants in the Workshop recognized that small satellites were a useful tool for acquiring and developing technology and contributing to education and training.

18. The participants also recognized that small satellite projects in Africa were promoting international cooperation within the region, as well as with European and Asian partners.

19. The participants emphasized the need for greater awareness among the public and among decision makers.

20. The participants in the Workshop recognized that the proposals made during UNISPACE III were fully applicable to Africa, but they made the following additional conclusions and recommendations that were more focused on the specific needs of the region:

(a) The Workshop recognized that the route of international cooperation should be explored more in order to foster the use of small satellite systems for the benefit of African and other developing countries, especially through the promotion of regional projects. For that purpose, the Workshop recommended that coordinated action be initiated to identify significant problems that were common to different countries in the region and that could be addressed with the help of small satellite technology. The Workshop also recommended that partnerships be developed between regions with common needs, such as the equatorial regions of different continents;

(b) Efforts had been made to develop space systems devoted to improving the quality of life in developing countries. To provide maximum economic and social benefits to the population in such countries, the Workshop recommended that relevant programmes be established in such a manner as to ensure continuity and sustainability;

(c) The Workshop highlighted in particular the importance of Earth observation programmes for developing countries and the benefits of international cooperative efforts. The Workshop therefore recommended that long-term strategic programmes be developed to ensure the acquisition and processing of the data needed for monitoring the environment and natural resources, as well as for decision-making;

(d) The Workshop recognized the benefits of small satellite programmes in the acquisition of technology and the development of spin-off enterprises. The Workshop therefore recommended that space activities be an integral part of any national programme devoted to technology acquisition and development;

(e) Finally, the Workshop recognized the importance of space development in education curricula, especially for motivating and training students. In line with recommendations made at UNISPACE III, the Workshop proposed that each country recognize the important role that space assets could play in education and the need to incorporate space into education, as well as to develop among the population and among decision makers an awareness of the benefits offered by space technology applications.

Notes

[1] *Report of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space, Vienna, 19-30 July 1999* (United Nations publication, Sales No. E.00.I.3), chap. I, resolution 1, annex, para. 32 (b).

[2] Ibid, annex III.

[3] The purpose of the IAA Subcommittee on Small Satellites for Developing Nations is to assess the benefits of small satellites for developing countries and to develop awareness on the subject in both developed and developing countries. The IAA Subcommittee publishes its findings and disseminates relevant information through workshops and symposia. In order to realize its goals, the IAA Subcommittee cooperates with: the United Nations and its Committee on the Peaceful Uses of Outer Space; the International Astronautical Federation and its Committee for Liaison with International Organizations and Developing Nations; and the International Space University.

[4] *Official Records of the General Assembly, Fifty-fifth Session, Supplement No. 20* (A/55/20), para. 37.